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Income On- and Off-Reserve:

How Aboriginals are Faring

Helmar Drost and
John Richards

In this issue...

Over the last two decades, aboriginal concerns moved to the centre of Canadian policy debates. However, most public attention is devoted to on-reserve communities, which is inadequate because growing numbers of the aboriginal population live off-reserve and in cities. The social, educational and employment problems facing both groups are daunting. For example, the median income for on-reserve aboriginals with incomplete high school is slightly over one-third that of nonaboriginals with similar education.

The Study in Brief

Over the last two decades, aboriginal concerns moved to the centre of Canadian policy debates. Most public attention has been devoted to on-reserve communities, which is inadequate: an increasing share of the aboriginal population lives off-reserve and in cities. According to the 1996 census, fully 71 percent of those who identified as aboriginals lived off-reserve; nearly half lived in urban areas.

Based on the 1996 census, this *Commentary* undertakes a careful examination of aboriginal incomes among those living on- and off-reserve. As a benchmark, results for nonaboriginal Canadians are also provided.

Off-reserve aboriginals continue to face serious social problems. Yet the census data reveal that, for all their problems, aboriginals living off-reserve are faring significantly better than those on-reserve. In 1995, the median income among off-reserve aboriginals was $12,400, 40 percent higher than the on-reserve median of $8,900. The median nonaboriginal income was $19,400, nearly 120 percent higher.

Off-reserve, one half all aboriginals have a high school diploma; on-reserve, only one third do. Among all Canadians ages 15 and older, roughly two-thirds have a high school diploma or better. Encouragingly, as aboriginal education levels rise, aboriginal incomes in general rise and the gap between their median incomes and those for similarly educated nonaboriginals in general diminishes. The median income for on-reserve aboriginals with incomplete high school is slightly over one-third that of nonaboriginals with similar education. Aboriginals with university degrees have a median income that is over four-fifths that of nonaboriginal university graduates.

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The core recommendation of the 1996 Royal Commission on Aboriginal Peoples (RCAP) was to enhance the viability of reserves by negotiating modern treaties and recognizing land claims. The commission concluded that the future of aboriginal Canadians lay primarily as members of separate nations within Canada.

RCAP was the culmination of a remarkable change in public attitudes toward the fate of aboriginals. As recently as the 1969 White Paper on Indian Policy, the federal government had intended to eliminate reserves and all formal distinctions between aboriginal and nonaboriginal Canadians. While we have no desire to rehabilitate the unworkable solution of the White Paper, the RCAP solution is also inadequate — for the simple reason that it affords an overwhelming importance to aboriginals living on-reserve, thereby understating the significance of those living off-reserve. According to the 1996 census, fully 71 percent of those who identified as a member of at least one of Canada's aboriginal groups lived off-reserve; only 29 percent lived on-reserve.[1]

That socioeconomic indicators for aboriginals are, in general, worse than for other Canadians is well known. Several studies, for example, have shown that a substantial wage gap exists between on- and off-reserve aboriginals, as well as between aboriginals and nonboriginals.[2] Yet differences in wages and other market earnings are incomplete measures of differences in standards of living. Differences in unearned income, such as government transfer payments, may partly offset differences in earnings.

What is new in this *Commentary* is that we attempt, using data from the 1996 census, to quantify the extent of inequality by looking at *total income*, earned and unearned, as the measure of economic well being. Because of its correlation with the ability of individuals and families to obtain goods and services, income is a common indicator of economic welfare. And the distribution of income reflects, albeit imperfectly, the distribution of economic well-being.

Our primary intention in this *Commentary* is to present data, not to propose policy. Implicit in our undertaking this work, however, is a concern that aboriginal poverty is probably Canada's most serious social policy blight and that understanding the nature of the problem requires detailed attention to the empirical evidence for it.

The study proceeds as follows. First, we discuss several shortcomings in using census income data as a measure of economic well-being. (For further discussion of the census income measure, see the Appendix.) Next, we use 1996 census data to provide estimates of average income and its distribution among aboriginals. Throughout this study, we are interested in the relative fortunes of aboriginals

We are indebted to Doug Norris for making data available from the 1996 census master file, and to Derrick Thomas at Statistics Canada and John Tibert at the Institute of Social Research, York University, for their excellent programming and computing work. Chunling Fu and Jessica Orkin provided valuable research assistance, and Garnett Picot and Andy Siggner made incisive comments regarding some of the limitations of our data and the resulting conclusions. Needless to add, the authors bear sole responsibility for any shortcomings or errors.

1 Based on the ethnic origin definition of the aboriginal population (see Box 2), an even higher 79 percent of aboriginals resided off reserve.

2 See, for example, Alam and De Civita 1990; Patrinos and Sakellariou 1992; George and Kuhn 1994; Clatworthy, Hull, and Laughren 1995; Pendakur and Pendakur 1996; Bernier 1997; and De Silva 1999.

Box 1: *Measuring Income Distribution*

The most frequently used statistic to measure the central tendency among a set of numbers such as income distribution is the *average* or *mean*, which is simply the sum of the relevant numbers divided by the number of observations. Another statistic to measure central tendency is the *median*: if the relevant observations — here, these are incomes reported by groups, variously defined — are ranked by size, the median is the numerical value such that half the relevant observations are larger and half smaller. *Average* and *median* coincide if the observations are symmetrically distributed. In the case of income distributions, the income interval containing the largest population share typically occurs at a relatively low income, and the distributions display long upper tails (see Figure 1). In such cases, the mean exceeds the median.

A second important aspect of a set of numbers is the extent to which they are tightly concentrated around their central tendency or are widely dispersed. A simple way to measure *income inequality* is to compare the share of total income received by the bottom and the top income groups, however defined. If one ranks the incomes of all individuals in a population from poorest to richest and then divides the population into, say, five equal groups, or *quintiles*, one can then compare the income share received by the top quintile relative to that received by the bottom quintile. An equal distribution of income implies that each quintile receives 20 percent of total individual incomes.

The *Lorenz curve* provides a visual picture of income inequality. The horizontal axis represents the cumulative percentage of income units (here, individuals) and the vertical axis the cumulative share of these units in overall income. The Lorenz curve coincides with the diagonal line *AB* if all incomes are equal. The extent to which the Lorenz curve deviates from the line of complete equality provides a measure of inequality: the farther the curve from the diagonal, the more unequal the income distribution. Comparing the equality of two different income distributions leads to unambiguous conclusions if one Lorenz curve lies completely inside the other — that is, if it is closer to the line of perfect equality.

A summary measure of inequality derived from the Lorenz curve is the *Gini coefficient*, defined as area I divided by areas I + II. If all incomes are equal, the diagonal and the Lorenz curve coincide and the Gini coefficient is zero. In a situation of perfect inequality, where one person receives all income and everyone else has no income, the Gini coefficient approaches the value one. The coefficient ranges usually between 0.2 and 0.5.

according to their location, whether on- or off-reserve. As a benchmark, we also present estimates for nonaboriginal Canadians. For each of these three populations, we break down income distributions by sex, age; education level, province (or region) of residence and city. We conclude by comparing changes in the level and distribution of income over the 1985-to-1995 period. In the Appendix, we discuss in some detail the calculation of the relevant populations from available census data.

Highlights of Our Findings

The highlights of our findings can be summarized as follows.

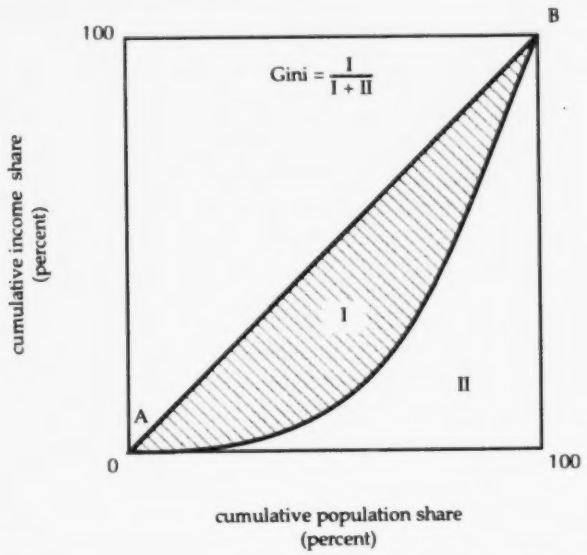
- In 1995, the median income of aboriginals (on- and off-reserve) was just 58 percent of that of nonaboriginals ($11,300 for aboriginals versus $19,400 for nonaboriginals). Among aboriginals, the median income of those living off-

Box 1 - continued

Another measure of income dispersion employed in this study entails breaking down the population into three intervals: the proportion of the observations in a *lower tail*, with values below one half the relevant median the proportion of the observations in a *middle interval*, defined as half to twice the median; and the proportion of the observations in an *upper tail*, with values above twice the median.

From these three intervals a simple statistic, the *polarization index*, can be constructed. This is the percentage of observations falling in one or other of the tails. The higher the index value, the more unequal is the distribution of income. The range is from zero (in which, case all observations lie in the middle interval) to 100 percent (in which case, all observations are either less than half or more than twice the median).

The Lorenz Curve and the Gini Coefficient



reserve was $12,400, while for those living on-reserve it was only $8,900. (For an explanation of such statistical concepts as median, see Box 1.)

- There is little difference in income inequality between aboriginals who live on-reserve and those who live off-reserve (as measured by the polarization index). Aboriginal incomes are, however, distributed considerably more unequally than those of nonaboriginals.
- Differences between aboriginals and nonaboriginals are much more pronounced among men than among women. The median income of on-reserve aboriginal males, for example, is only 36 percent of that of nonaboriginal males; the analogous ratio among women is 57 percent.
- Among nonaboriginals, incomes typically fall after the standard age of retirement; we found that the median income of nonaboriginals ages 65 and over was $5,500 lower than that of nonaboriginals ages 55-to-64. This pattern does not, however, obtain among aboriginals, for whom age profiles of income first rise, then decline, and finally, for those ages 65 and over, rise again. On-reserve aboriginals ages 65 and over have a median income that is actually $3,400

higher than those on-reserve ages 55-to-64. The comparable increase in median income among off-reserve aboriginals is $1,300.

- Aboriginals, both on- and off-reserve, are less well educated than nonaboriginals. Among all Canadians ages 15 and older, roughly one-third of nonaboriginals, one-half of off-reserve aboriginals and nearly two-thirds of those on-reserve lack a high school diploma.
- Encouragingly, as aboriginal education levels rise, aboriginal median incomes rise and the proportionate gap between their median incomes and those for nonaboriginals with similar education diminishes. At the bottom end of the scale, the median income of on-reserve aboriginals with incomplete high school is just one-third that of nonaboriginals with similar education. Aboriginals with university degrees, however, have a median income that is four-fifths that of nonaboriginals with similar education.
- There is considerable regional variation in the gap between aboriginal and nonaboriginal median incomes. In Atlantic Canada and Quebec, median aboriginal incomes (on- and off-reserve combined) are approximately 70 percent of that of nonaboriginals; in Ontario and British Columbia, they are roughly 60 percent; in the three Prairie provinces, the gap widens to approximately 50 percent. On-reserve aboriginals in the Prairie provinces fare the worst: their median income is less than 60 percent of that of off-reserve aboriginal and less than 40 percent of that of nonaboriginals.
- In the eight cities with the largest aboriginal populations, median incomes of aboriginals are lower in the west — particularly in Edmonton, Saskatoon, Regina and Winnipeg — than in the east.
- Over the 1985/95 period, the median income of on-reserve aboriginals fell from 53 percent to 46 percent of that of nonaboriginals. Off-reserve aboriginals also lost ground over the same period, their median income falling from 73 percent to 65 percent of that of nonaboriginals.
- Again over the 1985/95 period, aboriginal incomes became more unequally distributed, especially on-reserve. The top quintile of on-reserve income recipients received 50.6 percent of all income in 1985; this rose to 53.4 percent in 1995. Over the same period, the income received by the bottom quintile fell from 2.5 percent to 1.1 percent.[3]

Interpreting the Data

The Income Measure

The census income measure we use in this study is individual income. It includes total annual pre-tax, post-transfer income which, in turn, includes wages and salaries, net income from self-employment, investment income, government

3 It should be noted that the data reported in the last two bullets and for all of our comparisons over the 1985-to-1995 period are for aboriginals identified by ethnic origin. All other data refer to aboriginals who self-identify as such. See Box 2 for an explanation of these concepts of aboriginal population. Within the text, some rounding has been undertaken. Hence, some subtotals do not add up to the totals shown.

Box 2: *Defining the Aboriginal Population*

The 1996 census enumerated the aboriginal population using two concepts, *ethnic origin* and *identity*. Our comparisons of income distributions over the 1985-to-1995 period rely on the first concept because the 1986 and 1991 censuses did not ask about self-identification. Ethnic origin refers to the cultural group to which one's ancestors belonged, while identity designates the respondent's current identification or belonging. For example, some people may report in the census that they have, say, an Indian grandfather, but that they do not identify with this heritage. In this instance, they would be counted as part of the aboriginal ethnic origin population, but not part of the aboriginal identity population.

Our income distribution analysis for 1995 uses the aboriginal identity population. Indeed, given the inherent limitations of defining groups in terms of distant ancestors, social research is increasingly relying on self-reported identification. The identity population includes all persons who identified with at least one aboriginal group — that is, as a North American Indian, Métis, or Inuit — or was registered as an Indian under the *Indian Act*.

Virtually all aboriginals living on-reserve are registered Indians; a large majority of aboriginals living off-reserve are not registered Indians. Historically, aboriginals have been primarily rural dwellers, but the 1996 census determined the aboriginal identity population to be almost evenly divided between urban and rural. Since nearly all reserves are rural, the on-reserve population is overwhelmingly rural. The majority of the off-reserve aboriginal population is urban.

Our data source for 1995 results is the entire Census Master File, according to which the total aboriginal population in 1996 by the ethnic origin concept was 1,102,000. The aboriginal identity population that year was 799,000. Among the identity population, approximately 519,000 were of working age, defined as ages 15 and older. Of this working-age population, 144,000 lived on-reserve and 374,000 off-reserve — a ratio of roughly two on-reserve-to-five off-reserve. The census acknowledges that enumeration was not conducted on some reserves and, accordingly, the on-reserve aboriginal population was underreported. The nonaboriginal working-age population was 22,110,000.

transfer payments, pensions and miscellaneous income such as scholarships and alimony. Excluded are inheritances, capital gains or losses, the value of fringe benefits, income in-kind and the value of services received from government or other individuals during the year.

In using the distribution of census-defined individual income as an indicator of the relative economic well-being of on- and off-reserve aboriginals, one should keep two caveats in mind. First, aboriginals living on-reserve do not pay income, property or sales taxes; accordingly, their pre-tax and post-tax incomes are essentially the same. Aboriginals living off-reserve and other Canadians do not receive the same tax concessions. To the extent that income is the appropriate measure of standard of living, it would be preferable to use post-tax income. This information is not available from census questionnaires, however, so the income we report for off-reserve aboriginals and nonaboriginals is pre-tax income, which likely leads to an overestimation of the income gap between these two groups and on-reserve aboriginals.

Second, census statistics on aboriginal income exclude items that clearly affect economic well-being and that may differ systematically between on- and off-reserve

Figure 1: ***Distribution of Aboriginal and Nonaboriginal Income Recipients, by Location, 1995***

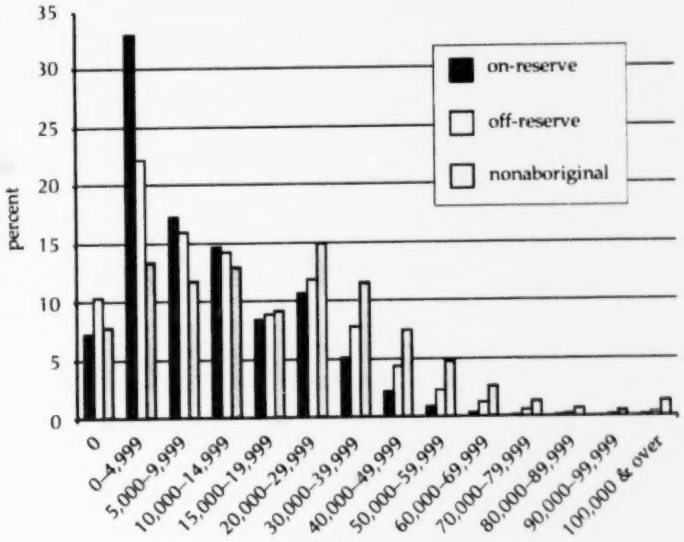
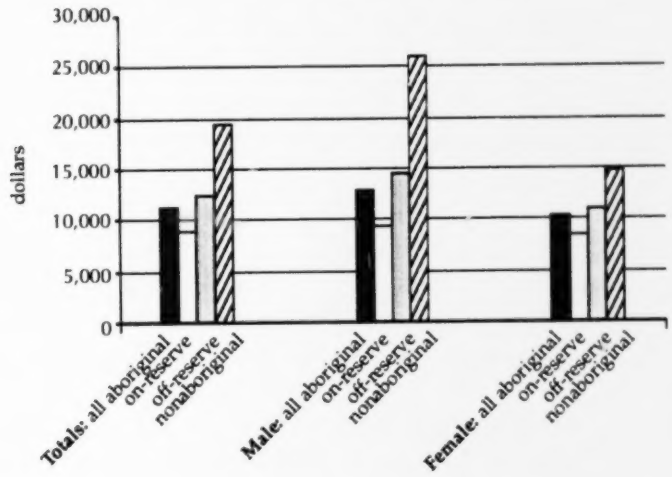


Figure 2: ***Median Incomes of Aboriginal and Nonaboriginal Income Recipients, by Location and Sex, 1995***



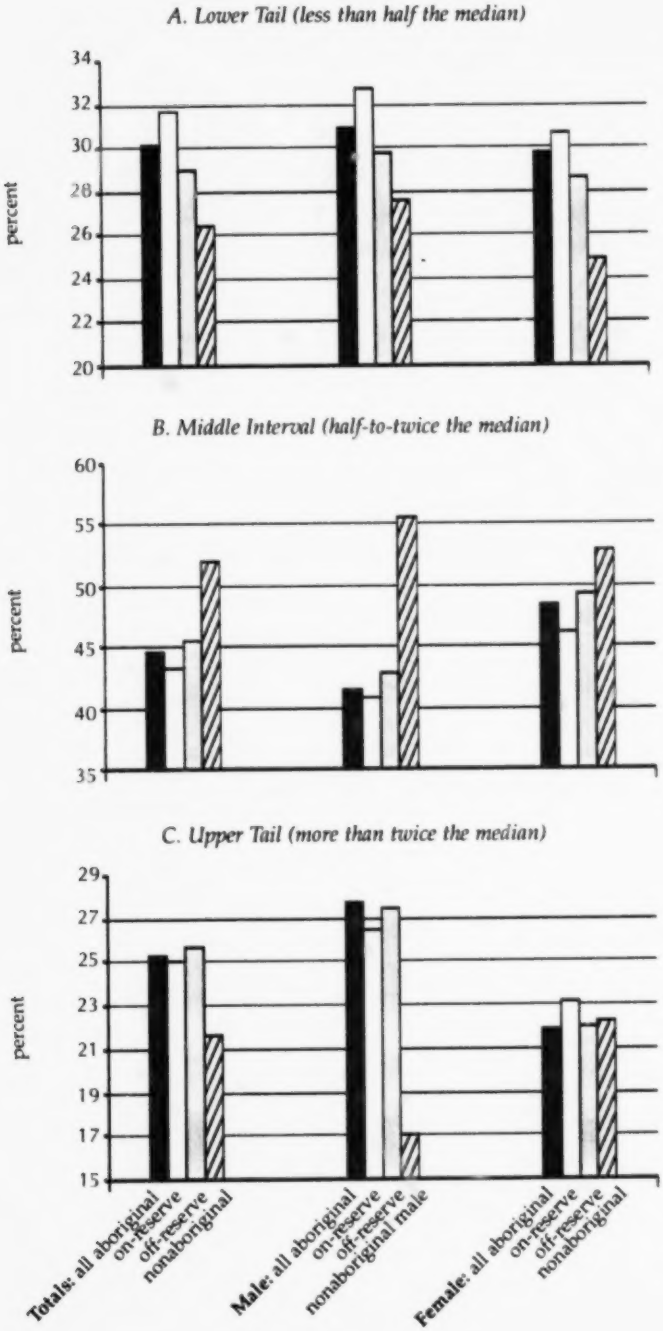
aboriginals. One such item is production for home consumption, represented by such traditional activities as hunting, fishing, and trapping, which are more prevalent among on-reserve aboriginals than those off-reserve. To the extent that the products of these activities are consumed by aboriginals themselves, their imputed value should be taken into account. Another excluded item is rent or, in the case of home ownership, the imputed value of rent. People who live off-reserve own, lease, or rent housing. On-reserve aboriginals typically enjoy free housing. As with after-tax income, income measures incorporating such imputed items are not available.

Income Inequality

Income distributions among groups of people can be analyzed in terms of both *central tendency* (is one group on average richer or poorer than another?) and the *dispersion of income* (is income more equally distributed among one group relative to another?).

The idea of inequality of income distribution has both objective and normative meanings. On the one hand, various measures exist to determine the extent of inequality in an objective sense. On the other hand, inequality can be interpreted in a normative sense: the implication is usually that greater inequality corresponds to a lower level of social welfare for a given total income (Wilson 1966; Sen 1997). Yet, the mere fact that inequalities in income exist is not a sufficient basis for conclusions about justice or the lack of it. The income an individual receives has to be viewed in relation to his or her need which, in turn, depends on age, family size, health and so on. Individuals also differ in their willingness to work, their propensities to save, and their aversion to taking economic risks. Such considerations mean one can make no direct inferences from any given degree of income inequality to statements about distributive justice. Thus, although we are concerned about the size of the income gap between aboriginals and nonaboriginals, we make no prescriptive statements about the desirable extent of income inequality within either population.

Figure 3: ***Distribution of Aboriginal and Nonaboriginal Incomes, by Location and Sex, 1995***



Census Results on Income Distributions for 1995

In this part of the study, we disaggregate the three populations — on-reserve aboriginals, off-reserve aboriginals and nonaboriginals — in various ways in an attempt to describe income distributions more precisely.

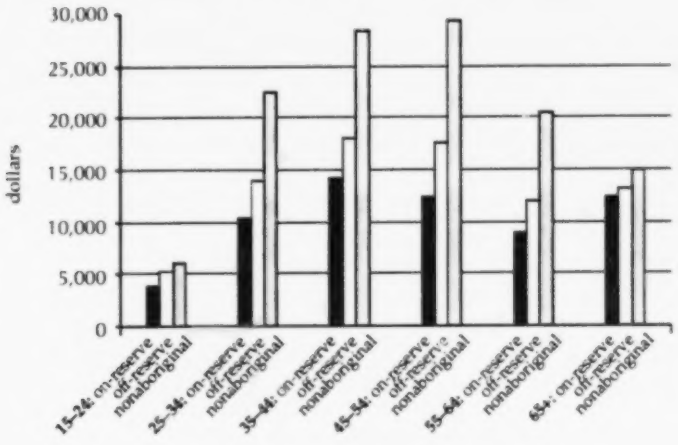
As Figure 1 shows, aboriginal incomes in 1995 were heavily concentrated in the lower intervals. Fully 57 percent of on-reserve and 48 percent of off-reserve aboriginals of working age reported either no income or income below $10,000. Among nonaboriginals, 33 percent were found in these two income categories. Individuals with incomes of $30,000 and higher comprised just 9 percent of on-reserve and 17 percent of off-reserve aboriginals, compared with 30 percent of nonaboriginals.

Incomes of aboriginals are typically much lower than those of nonaboriginals, as Figure 2 shows. In 1995, the median income for all aboriginals was $11,300, or just 58 percent of the $19,400 median for nonaboriginals.[4] Aboriginals living off-reserve had a median income of $12,400, while those living on-reserve had a median income of just $8,900, less than half that of nonaboriginals. Except for aboriginals with a university degree, those living off-reserve, no matter how that population is disaggregated, have a higher median income than those living on-reserve.

One explanation for the income gap is hours worked. Aboriginals, particularly on-reserve, work disproportionately part-year and part-time, which lowers their annual earnings relative to nonaboriginals. Other factors that systematically vary between aboriginals and nonaboriginals are level of education, quality of schooling, age distribution, marital status, and health. In the discussion below, we disaggregate the data by a number of these variables, but

4 Note that all medians and polarization measures exclude individuals who reported no income. Calculations of medians and the frequencies within each of the three income groups used to calculate the polarization measures were undertaken by means of linear interpolation within the relevant income group. This implies that the distribution is uniform within any particular income group.

Figure 4: ***Median Incomes of Aboriginal and Nonaboriginal Income Recipients, by Location and Age, 1995***



we do not attempt an econometric study to estimate the incremental contribution each individual variable makes to the total income gap between the two populations.

Figure 3 shows how income is distributed among aboriginals and nonaboriginals by location and sex, according to the three-interval polarization index described in Box 1. The figure reveals that aboriginal incomes (on- and off-reserve combined) are considerably more unequally distributed than are those of nonaboriginals. Among the former, 44 percent of income recipients had incomes in 1995 that fell in the middle interval between half and twice the relevant median; 56 percent had incomes in either the lower or upper tail. By contrast, 52 percent of nonaboriginals had incomes lying between half and twice the (much higher) nonaboriginal median and 48 percent had incomes in the tails. Hence, by definition, the polarization index is 56 percent for aboriginals and 48 percent for nonaboriginals.

Disaggregating by Sex

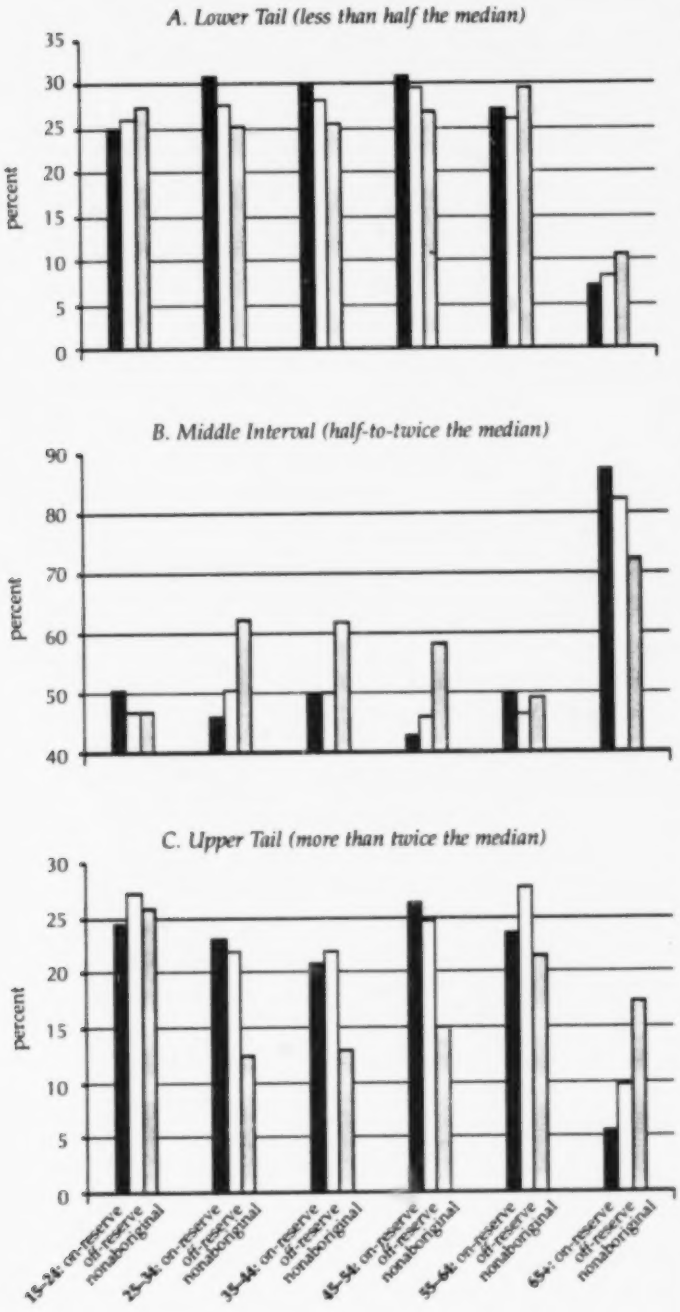
As illustrated in Figure 2, aboriginal-nonaboriginal differences are much more pronounced among men than among women. The median income of on-reserve males, for example, was only 36 percent of that of nonaboriginal males in 1995; the analogous ratio among women was 57 percent.

The same pattern can be seen in Figure 3 in terms of polarization measures. The polarization index assumes a value of 59 percent for aboriginal males versus 45 percent for nonaboriginal males. Most of this difference occurs in the upper tail: the proportion of aboriginal men with incomes more than twice the relevant median is more than 10 percentage points higher than the corresponding group of nonaboriginal men. The polarization indices among women are far closer: 52 percent for aboriginal women, 47 percent for nonaboriginal women.

Disaggregating by Age

As Figure 4 shows, young aboriginals ages 15-to-24 typically have incomes not much lower than those of nonaboriginals of the same ages. The result is complicated, however, by the fact that a much larger fraction of nonaboriginals than of aboriginals in this age group is attending postsecondary educational institutions, meaning that incomes of nonaboriginals in this age group are a poor indicator of lifetime incomes. Indeed, median incomes of the next group, those ages 25-to-34, show nonaboriginals pulling away from aboriginals nearly to the same extent as occurs among those in older age groups. Proportionately, median incomes among

Figure 5: ***Distribution of Aboriginal and Nonaboriginal Incomes, by Location and Age, 1995***



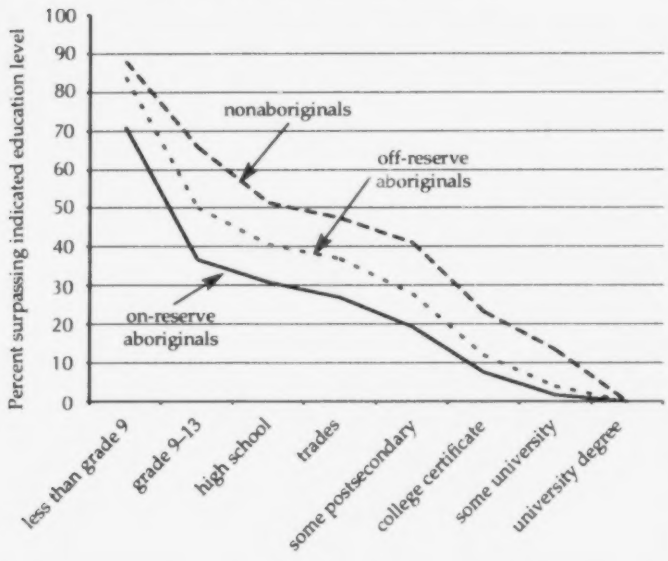
aboriginals ages 25-to-34 are approximately as far from nonaboriginal median incomes in the relevant age group as is the case among aboriginals in the 35-to-44, 45-to-54, and 55-to-64 age groups.

For nonaboriginals, the age profile of median income follows the expected inverted-U shape: it starts low, rises, peaks in the 45-to-54 age group, then declines. Median incomes of aboriginals are much lower than those of nonaboriginals at every age through 64 and peak much earlier, in the 35-to-44 age group.

For individuals ages 65 and over, incomes are dominated by pension income and old age security transfers. As is to be expected, the median income of aboriginals in this age group is not much below that of nonaboriginals. However, an interesting divergence exists. While nonaboriginal income falls after the standard age of retirement, this pattern does not obtain among aboriginals, whose median income actually rises for those ages 65 and over. For example, the median income of on-reserve aboriginals ages 65 and over is $3,400 higher than that of individuals on-reserve ages 55-to-64. The reason for this increase is likely that receipt of transfers available to those 65 and older more than offsets the decline in employment earnings between the two age cohorts. A similar, if smaller, increase occurs among off-reserve aboriginals, whose median income, ages 65 and over, is $1,300 higher than that of those ages 55-to-64.

As Figure 5 shows, among both aboriginals and nonaboriginals, incomes are least dispersed for those ages 65 and over, with nonaboriginal incomes being more dispersed than those of aboriginals. Among 15-to-24 and 55-to-64-year-olds, polarization measures are similar among the three relevant populations. However, aboriginal incomes are considerably more polarized than nonaboriginal incomes for individuals in their peak earning years, ages 25-to-54. Polarization index values are 12-to-15 percentage points higher for aboriginals than for nonaboriginals in this age group.

Figure 6: ***Education Profiles among Aboriginals and Nonaboriginals, 1996***



Disaggregating by Education Level

In Figure 6, the census data on education achievement are presented in the form of education profiles (see Box 3 for an explanation of this concept). As is to be expected, the profile for the nonaboriginal population dominates those for the two aboriginal populations. Also, the profile among the off-reserve population clearly dominates the on-reserve profile. Since high school completion is the minimum formal education requirement for many jobs, it is worth noting the proportion of each population that has not attained this level of education: among those ages 15 and over, roughly one-third of nonaboriginals, one-half of off-reserve aboriginals, and nearly two-thirds of those on-reserve lack a high school diploma. Superior educational achievement is a key factor in explaining the higher median incomes of off-reserve aboriginals than of those on-reserve.

Figure 7 shows that, not surprisingly, as years of education rise, median incomes in general rise. Note, however, that the median income of those with trades qualifications generally exceeds that of individuals who have some postsecondary education but not a completed certificate, diploma or degree.

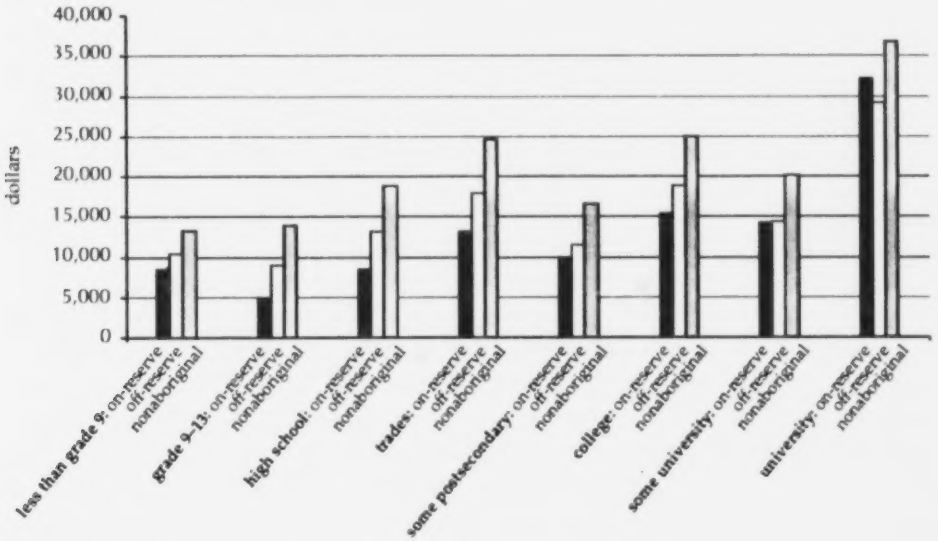
One encouraging finding is that, as aboriginal education levels rise, not only do aboriginal median incomes rise but the gap between their median incomes and those of nonaboriginals with similar education diminishes. There is one major and two minor exceptions to this finding. The major exception is that median incomes decline among aboriginals as they move from less than grade 9 to incomplete high school. Furthermore, the largest proportionate gaps in aboriginal-nonaboriginal median incomes occur not at the lowest education level but among those with incomplete high school. At this level the gap between on-reserve aboriginal and

Box 3: ***Education Profiles***

Education profiles, such as those shown in Figure 6, represent the cumulative educational attainment of the relevant population. The height of the curve for any education level is the percentage having more than the specified level. For example, among on-reserve aboriginals, 37 percent have more than grade 9–13. In other words, 37 percent have at least a high school diploma. Among this population, 31 percent have education beyond a high school diploma. The difference between these statistics, 6 percent (= 37 – 31), is the proportion with a high school diploma but no further formal training. Among off-reserve aboriginals, 50 percent have at least a high school diploma; among nonaboriginals, 66 percent do. The final statistic for each population, by construction 0 percent, includes the entire population. The penultimate statistic gives the proportion having earned a university degree.

If everyone in a population possessed a university degree, its profile would resemble an L rotated around both a vertical and horizontal axis. If no one had completed elementary school, the profile would be a horizontal line along the bottom of the figure. Rotating an education profile clockwise implies higher overall education achievement.

Figure 7: ***Median Incomes of Aboriginal and Nonaboriginal Income Recipients, by Location and Education Level, 1995***



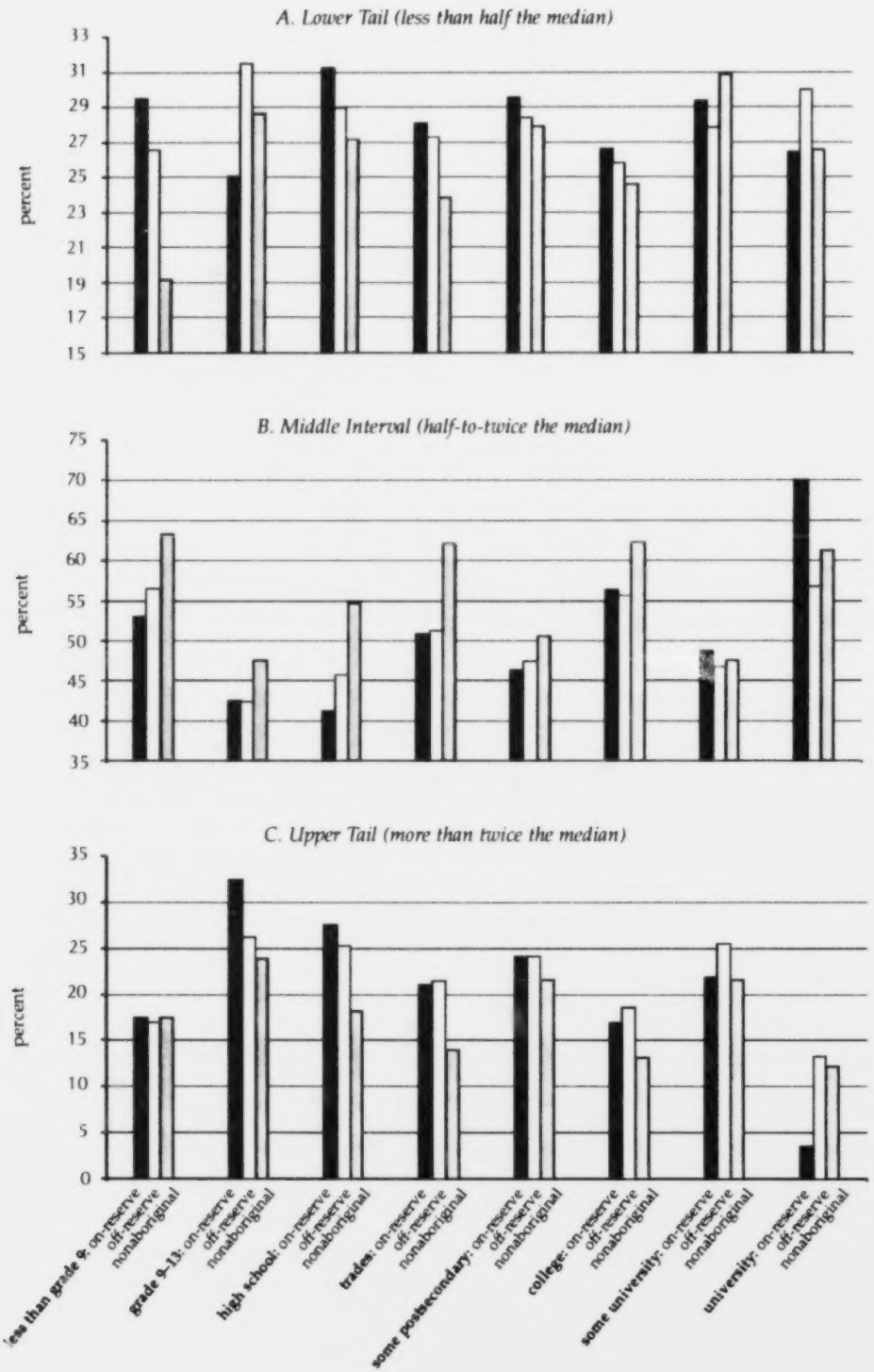
nonaboriginal medians is very large, nearly two-thirds the nonaboriginal median. The analogous statistic for off-reserve aboriginals is over one-third.[5] At higher education levels, the gaps are much narrower: the median income of aboriginals with some university training is seven-tenths the corresponding nonaboriginal median, while the median income of aboriginals with university degrees is eight-tenths that of nonaboriginals with similar education.

Even at the highest education levels, however, a gap persists between aboriginals and nonaboriginals. Without a closer examination of the relevant characteristics of the income recipients, we can only speculate that some portion of the gap has to do with aboriginals' relative lack of seniority and work experience. One of the major social changes of the past 30 years is the increase in the number of aboriginals with education beyond high school. This phenomenon is still a relatively recent one, and the average age of aboriginals with advanced education levels is lower than that of nonaboriginals with similar education. Other variables — such as distance from urban labour markets — also matter. It is also likely, and this again is speculation, that at least some portion of the gap is caused by discriminatory practices in the labour market, in terms of hiring decisions or a relative lack of union representation of aboriginal workers. This type of discrimination, moreover, may be particularly common in labour markets accessible to those with low levels of education.

At the six lower education levels illustrated in Figure 8, polarization indices for aboriginals exceed those for nonaboriginals, with the largest differences between

5 The minor exceptions both take place among off-reserve aboriginals. Relative to nonaboriginals with the same education level, the off-reserve aboriginal median gap does not always decline as education rises. For those with trades qualifications, the proportionate gap is 27 percent of the nonaboriginal median. The gap rises to 30 percent for those with some postsecondary education. For those with college diplomas, the gap is 24 percent; among those with some university, it is 28 percent.

Figure 8: ***Distribution of Aboriginal and Nonaboriginal Incomes, by Location and Education Level, 1995***



those for on-reserve aboriginals and nonaboriginals. For three education levels (less than grade 9, high school diploma and trades qualifications), the differences exceed 10 percentage points. At the two highest education levels, off-reserve aboriginals experience polarization similar to that for nonaboriginals and on-reserve aboriginals experience less polarization.

Disaggregating by Province

Examining median incomes by province (see Figure 9) drives home the fact that aboriginal poverty is most acute in the three Prairie provinces. It is here that aboriginal median incomes are lowest, both in absolute terms and relative to those for the corresponding nonaboriginal population.

In Atlantic Canada[6] and Quebec, median aboriginal incomes (on- and off-reserve combined) are approximately 70 percent of the respective nonaboriginal medians; in Ontario and British Columbia, they are approximately 60 percent; in the three Prairie provinces, approximately 50 percent. Median incomes are lowest among Prairie on-reserve aboriginals: less than 60 percent of the respective off-reserve aboriginal medians and less than 40 percent of nonaboriginal medians.

Even at the highest education levels, aboriginals earn significantly less than nonaboriginals.

In aggregate, we know that incomes are distributed somewhat more unequally among on-reserve aboriginals than among off-reserve aboriginals and that nonaboriginal incomes are the least unequally distributed. There are also important regional differences in income distributions. Those differences are most apparent in a comparison of inequality between on-reserve aboriginals and nonaboriginals. Table 1 shows that polarization index values for on-reserve aboriginals range from a low of 0.47 in Atlantic Canada to a high of 0.58 in each of the three Prairie provinces. Among nonaboriginals, the polarization index range is much narrower, from 0.45 to 0.49. By this measure, the income distribution in Atlantic Canada and Quebec diverges from the national trend. In these regions, on-reserve aboriginal incomes are more equally distributed than are nonaboriginal incomes; elsewhere in the country, the reverse is true. Since both the lowest polarization among nonaboriginals and the highest among on-reserve aboriginals occur in the three Prairie provinces, it follows that this region experiences the largest interracial differences in inequality.

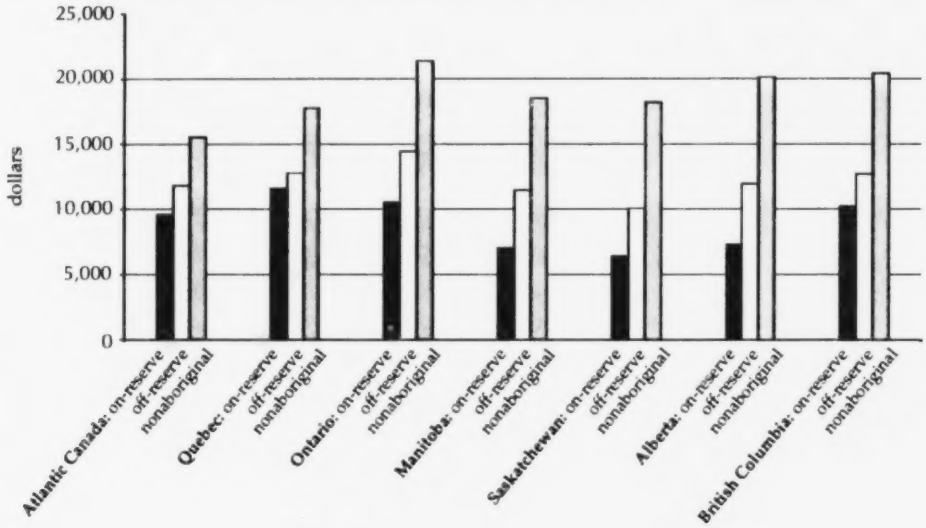
Differences in income polarization between populations can arise due to differences in the share of population in either the bottom tail of the distribution, the upper tail, or both. Table 1 displays this breakdown. In the Prairies, where differences between on-reserve aboriginal and nonaboriginal distributions are most pronounced, the interracial differences largely reflect differences in the upper tails.

Disaggregating by Urban Residence

The past half-century has seen a dramatic increase in the growth of the urban aboriginal population. According to the 1951 census, only 7 percent of aboriginals

6 For the sake of brevity, we have combined the census results for the four Atlantic provinces into one Atlantic region.

Figure 9: ***Median Incomes of Aboriginal and Nonaboriginal Income Recipients, by Location and Province, 1995***



were urban dwellers; by 1996, almost half were (Drost 1995). Parallel to the rural-urban shift, the urban population itself has shifted away from small towns and cities to large metropolitan centres. In 1951, slightly more than one-quarter of urban aboriginals resided in cities with more than 100,000 people, while close to 45 percent lived in towns with fewer than 10,000 people. By 1996, more than 60 percent of urban aboriginals were concentrated in Canada's large metropolitan areas.

Western Canadian cities have higher concentrations of aboriginals than do cities in the east, a reflection of the regional distribution of Canada's aboriginal and nonaboriginal populations. In 1996, close to 70 percent of the aboriginal population lived west of Ontario, while only about 30 percent of Canada's total population did so. Among aboriginals in the eight cities with the largest aboriginal populations, mean and median incomes are lower in the west than the east, a phenomenon that is particularly marked in Edmonton, Regina/Saskatoon and Winnipeg. Lower average incomes in these cities are also associated with higher inequality, as measured by Gini coefficients. (See Table 2 and refer back to Box 1.)

Changes, 1985-to-1995

To compare changes in income distributions over the 1985-to-1995 period, we looked at data from the 1986, 1991, and 1996 censuses. Since the concept of "aboriginal identity" was first used in the 1991 Aboriginal Peoples Survey and reintroduced in a modified form in 1996, the data we use in this part is based on the concept of "aboriginal ethnic origin" (refer back to Box 2).

Changes in Income Levels

Income distributions for the aboriginal and nonaboriginal populations diverged considerably over the 1985-to-1995 decade, both in central tendency as well as

Figure 10: ***Distribution of Aboriginal and Nonaboriginal Incomes, by Location and Province, 1995***

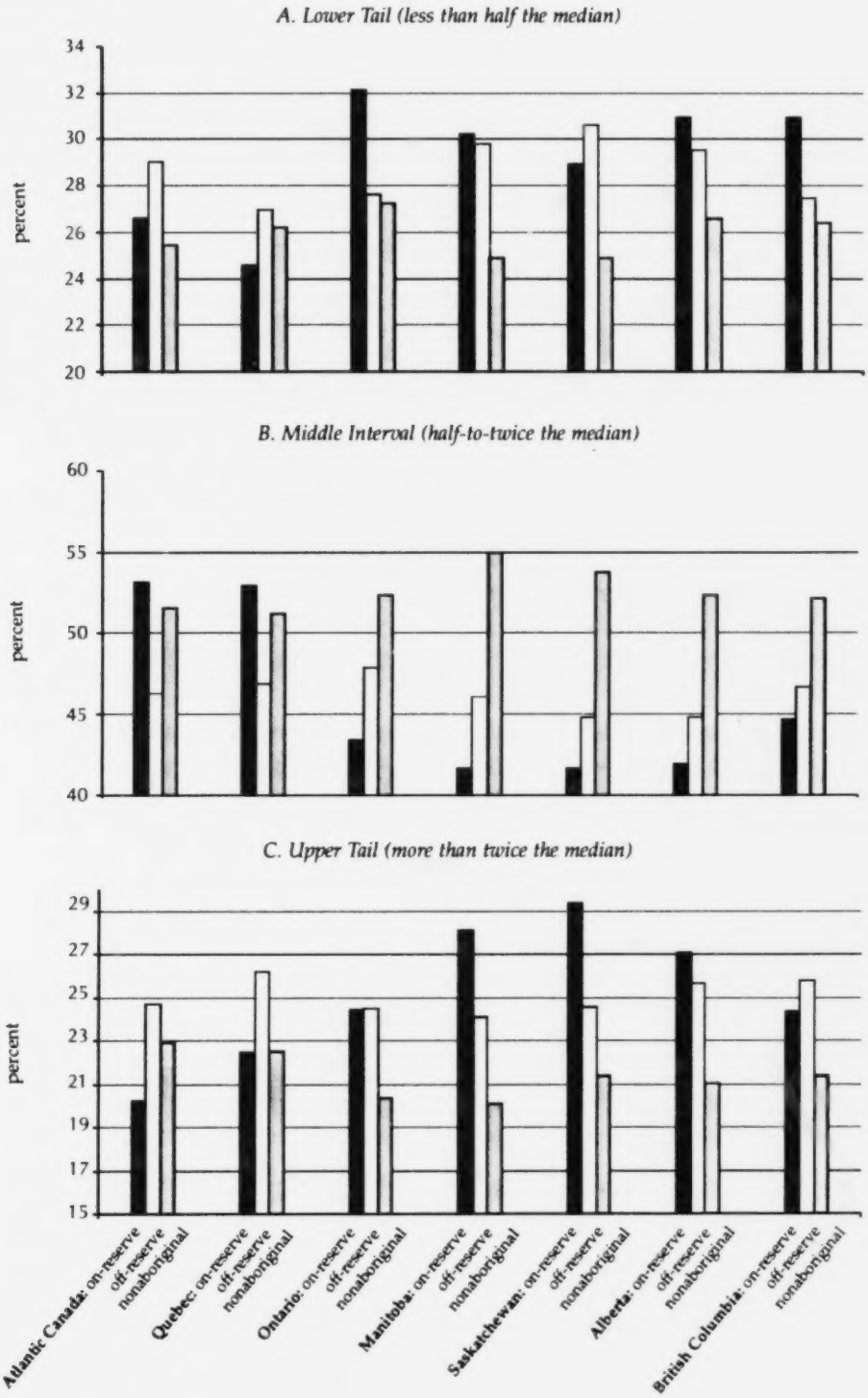


Table 1: ***Disaggregation of Polarization Indices, On-Reserve Aboriginals and Nonaboriginals, by Region***

	Share of Distribution in Lower Tail			Share of Distribution in Upper Tail			Polarization Indices		
	On-Reserve Aboriginals (A)	Non-Aboriginals (B)	Difference *(A – B)* (C)	On-Reserve Aboriginals (D)	Non-Aboriginals (E)	Difference *(D – E)* (F)	On-Reserve Aboriginals (G)	Non-Aboriginals (H)	Difference *(G – H)* (I)
Atlantic Canada	0.27	0.25	0.01	0.20	0.23	–0.03	0.47	0.48	–0.02
Quebec	0.25	0.26	–0.02	0.22	0.23	0.00	0.47	0.49	–0.02
Ontario	0.32	0.27	0.05	0.24	0.20	0.04	0.57	0.48	0.09
Manitoba	0.30	0.25	0.05	0.28	0.20	0.08	0.58	0.45	0.13
Saskatchewan	0.29	0.25	0.04	0.29	0.21	0.08	0.58	0.46	0.12
Alberta	0.31	0.27	0.04	0.27	0.21	0.06	0.58	0.48	0.10
British Columbia	0.31	0.26	0.05	0.24	0.21	0.03	0.55	0.48	0.08

Note: Due to rounding, column subtractions may differ from figures shown.

Table 2: ***Income Distribution Measures for Aboriginal Income Recipients, Selected Metropolitan Areas, 1995***

	Montreal	Toronto	Winnipeg	Regina/ Saskatoon	Calgary	Edmonton	Vancouver
Income share, by quintile (%)							
Bottom	2.4	1.9	1.7	1.3	2.0	1.3	2.4
Second	1.9	7.5	7.5	7.1	7.6	7.0	8.0
Third	16.3	14.6	14.9	13.4	15.3	13.7	14.7
Fourth	25.2	26.9	25.1	23.6	25.0	25.8	25.2
Top	46.4	49.0	50.8	54.6	50.1	52.2	49.7
Median income ($)	15,660	15,459	11,250	9,148	13,958	9,529	13,971
Mean income ($)	20,217	22,815	15,367	14,101	17,947	14,038	18,664
Gini coefficient	0.45	0.49	0.49	0.53	0.48	0.51	0.48

Table 3: ***Income Distribution Measures for On- and Off-Reserve Aboriginal and Nonaboriginal Income Recipients, 1985–95***

	On-Reserve Aboriginals			Off-Reserve Aboriginals			Nonaboriginals		
	1985	1990	1995	1985	1990	1995	1985	1990	1995
Income share, by quintile (%)									
Bottom	2.5	0.8	1.1	2.1	2.3	1.9	2.8	3.1	2.4
Second	7.7	6.2	6.3	7.5	8.2	7.2	8.5	9.0	8.4
Third	14.9	13.8	14.3	14.7	15.1	14.0	15.3	15.9	15.2
Fourth	24.3	25.0	24.9	25.4	25.9	25.1	25.4	24.9	24.9
Top	50.6	54.2	53.4	50.1	48.5	52.1	48.0	47.1	49.2
Median income ($)	7,260	6,425	8,859	10,147	13,773	12,509	13,884	19,046	19,191
Mean income ($)	9,683	9,490	12,235	13,983	18,443	18,256	18,229	24,024	25,402
Gini coefficient	0.482	0.535	0.524	0.480	0.468	0.506	0.458	0.444	0.472

inequality, as Table 3 shows. In 1985, the median income of on-reserve aboriginals was 52 percent of the median of nonaboriginals. Ten years later, the gap had widened. On-reserve aboriginals now had median incomes just 46 percent of nonaboriginal incomes. Off-reserve aboriginals also lost ground. Over the decade, their median income fell from 73 percent to 65 percent of the nonaboriginal median. (Although percentages differ, the trends are similar whether measured in terms of means or medians.)

Off-reserve aboriginal incomes changed more or less in sympathy with incomes of nonaboriginals. Incomes of both populations rose significantly over the 1985-to-1990 period, then declined and stagnated respectively over the recession years of 1990-to-1995. On-reserve aboriginal incomes behaved quite differently, falling somewhat in the 1985-to-1990 period, then rising sharply after 1990.

Changes in Income Inequality

Over the course of the decade, aboriginal incomes became more unequally distributed, especially for those on-reserve. The top quintile of on-reserve income recipients received 50.6 percent of all income in 1985; this rose to 53.4 percent in 1995. Over the same period, the income received by the bottom quintile fell from 2.5 percent to 1.1 percent. In terms of top versus bottom quintiles, income inequality also increased for off-reserve aboriginals and nonaboriginals, but the increases were less pronounced than among the on-reserve population. The same trends are found using Gini coefficients, which increased over the decade for on-reserve, off-reserve and nonaboriginal income recipients by 8.7, 5.4, and 3.1 percent, respectively. Since our income measure includes transfer payments, which have an equalizing effect, the growing income inequity between the two aboriginal populations and the nonaboriginal population may reflect an increasing inequity in earnings from work.

As is the case for means and medians, the Gini coefficients for off-reserve and nonaboriginal income distributions moved more or less in sympathy, falling

between 1985 and 1990, then rising between 1990 and 1995 by more than they had earlier fallen. On-reserve Gini coefficients behaved differently, rising significantly between 1985 and 1990, then declining slightly.

For the on-reserve population, income inequality increased significantly between 1985 and 1990. The three lowest quintiles all lost income share, while the fourth and fifth quintiles gained. The increase in the Gini coefficient by 11 percent (from 0.482 to 0.535) between 1985 and 1990 represents a huge jump in inequality. The reduction in inequality during the second five-year period was small compared with the increase during the first.

What explains the divergent changes in income distributions of the three groups? Macroeconomic conditions generally have important effects. In the short run, changing income distributions are driven by changes in factor demand, not by changes in the supply of human and physical capital, which occur only gradually. Changes in factor demand, in turn, are largely determined by the business cycle. During the 1985-to-1990 period, the Canadian economy experienced relatively high growth rates in real gross domestic product, whereas the early 1990s were marked by a deep and protracted recession. (The economic slowdown in Canada was the worst among the Group-of-Seven major industrialized countries.) Recessions accompanied by high unemployment tend to increase income inequality, while periods of rapid expansion often reduce it. The Gini coefficients among the nonaboriginal and off-reserve aboriginal populations conform to this pattern.

There is compelling evidence that aboriginal poverty is Canada's worst social wound. Curing it will not be easy; ignoring it will make the task impossible.

On-reserve incomes, however, seem less affected by macroeconomic fluctuations. One reason could be that most reserves are located in remote areas only weakly connected to the core sectors of the economy. Also, the relatively higher welfare dependency of on-reserve aboriginals may shield their incomes from the negative effects of a recession. While these factors may explain why income inequality on reserves was seemingly unaffected by the business cycle, the explanation of the reverse pattern in inequality during the 1985-to-1990 and 1990-to-1995 periods for the on-reserve population remains open. Other factors — demographic, institutional, or structural — must have played a role. For example, the process of budgetary devolution from the federal Department of Indian and Northern Affairs and changes in the educational composition of the on-reserve population may be important. Generally, increases in government transfer payments tend to reduce income inequality by augmenting incomes at the lower end of the income spectrum, and on-reserve welfare use rose significantly in the early 1990s.[7] Finally, it cannot be ruled out that the changes apparently observed over time for on-reserve aboriginals are a figment of the incomplete census enumeration process for this population, which may have affected the distributions in unknown ways (see the discussion in the Appendix).

7 See Canada (2001); these data are summarized in Richards (2001, 33–35).

Conclusion

Off-reserve aboriginals continue to face serious social problems — many, for example, live in the poorest of urban neighborhoods (see Richards 2001). Yet the census data reveal that, for all their problems, aboriginals living off-reserve are faring significantly better than those living on-reserve. The remote locations of many reserves pose near-insurmountable difficulties in terms of generating productive employment at reasonable wages, in attracting investment and in sustaining adequate consumer, health and education services. The problem of remote locations is exacerbated by the fact that reserve communities have a high proportion of young people. Generating employment for the large numbers of young aboriginals is a daunting task.

Revisions to treaties could, to some extent, improve the long-term economic fortunes of on-reserve residents by a transfer of employment-generating assets. In British Columbia, to take one example, band councils and the provincial government are considering a reform to give more substance to aboriginal fishing rights. Bands would obtain access to a negotiated share of the entire west coast salmon fishery. The precedent for such a reform is U.S. policy in the adjacent state of Washington (Cejalvo 2002).

As we stated at the beginning, our intention in this *Commentary* was to present data, not to propose policy. We believe there is compelling evidence that aboriginal poverty is Canada's worst social wound. Curing it will not be easy; ignoring the evidence will make the task impossible.

Appendix: Data Sources and Interpretation

The census, the principal source of data for this study, has several shortcomings. First, the analysis is restricted to the distribution of incomes among individuals. For most sources of income, the individual is the basic income-receiving unit, and incomes of families are largely derived from incomes of individual family members. However, families are generally the units in which consumption decisions are made and incomes are pooled within families. If one is interested in the distribution of economic well-being across consuming units, then the family is the preferable unit to study. Unfortunately, data on aboriginal family income are not available for the period under consideration.[8]

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8 An aboriginal ethnic origin variable was not created in either the family file of the Public Use Sample Tape of the 1986 census or the Public Use Microdata File of the 1991 census. The ethnic origin of husband/wife or male/female lone parents can be identified only for individuals of British or French descent. It was, therefore, not possible to separate aboriginal families from nonaboriginal families.

The second shortcoming of the census data is that individual incomes include government transfer payments for families. While most government transfer payments (such as old age security and pension benefits, employment insurance benefits, social assistance payments to single mothers with dependent children, persons permanently unable to work, the blind and the disabled, veterans' allowances, and so on) are paid to the individual who qualifies for the payments, some transfers (such as federal child tax benefits) are based on family income levels. They are paid to the individual in a family who is the principal applicant. As such, these payments may overstate the income of the principal applicant relative to other income earners in the family. Whether the transfer payments based on family income levels are sufficiently high to affect differentially individual incomes of the aboriginal and nonaboriginal populations and their respective income distributions is an empirical question that cannot be answered given our study's data constraints.

A third shortcoming is that, typically, individual earnings rise with age, then decline near retirement age. Income follows a similar pattern. Young adults, going to school and working part-time or just starting full-time jobs, are likely to have much lower incomes than middle-aged adults in their peak earning years. Likewise, elderly adults are also likely to receive lower incomes since most are not engaged in market work. Accordingly, a more reasonable basis on which to analyze income distribution would be life-time incomes, not incomes at a point in time. Probably, the point-of-time inequalities reported in our study overstate the degree of life-cycle income inequality among individuals.

A final shortcoming of the census data is that, conceptually, consumption is the most direct measure of an individual's well-being. In developed countries, consumption is more equally distributed than income, reflecting the ability of individuals and households to smooth and redistribute income.[9] Also, a comparison of the distribution of consumption with the distribution of income would enable a comparison of the effects of private redistribution (through saving and borrowing) to those of public redistribution (through the tax-transfer system).[10]

Notwithstanding these drawbacks, the census remains the most comprehensive source of demographic and income data for Canadians in general, and aboriginals in particular.

Specification of On- and Off-Reserve Aboriginal Ethnic Origin Populations

Since changes in income distribution generally occur gradually, tracking changes over a period longer than a decade would have been desirable. However, changes in the wording of the census question on ethnic origin introduced in the 1986 census severely limit comparability of aboriginal population data for earlier census years.

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9 For studies of the U.S. and Canadian cases, see, for example, Johnson and Shipp (1997); and Pendakur (1998).

10 Barnett, Crossley, and Worswick (1999) offer such a comparison for Australia.

1986 Census Data

The population and income data for 1986 were derived from the individual records of the Public Use Sample Tape (PUST) of the 1986 census. The PUST contains information on 500,434 Canadian residents, or about 2 percent of the national population. Of this total, 14,299 individuals (2.9 percent) reported either a single or a multiple aboriginal origin. Of this group, 3,327 individuals (23 percent) were living on-reserve and 10,972 (76 percent) off-reserve. Removing from the total all aboriginals ages 15 and under left us with a sample of 9,059 individuals, 2,072 (23 percent) on-reserve and 6,987 (77 percent) off-reserve. The nonaboriginal sample included 383,621 people of working age.

Deriving the on-reserve population from the 1986 PUST posed problems. Although information on the reserve status of aboriginal peoples was collected in the 1986 census, an on-reserve versus off-reserve variable was not included in the PUST. However, it was possible to construct this variable by combining information on household type, household class and housing tenure (see Wright 1991).

At the time of the 1986 census, enumeration was not permitted or was interrupted before it could be completed in some Indian reserves and settlements. Other reserves and settlements were enumerated late or the quality of the data collected there was considered inadequate. It is estimated that about 45,000 individuals, approximately 6 percent of the total aboriginal population, were not counted. The magnitude of the potential bias resulting from such underenumeration is unknown. Since our study uses only high-level geographic areas (such as provincial aggregates), the impact of the missing data is likely to be small (see Statistics Canada 1989, "Definitions and Special Notes").

1991 Census Data

The demographic and income information for 1991 was taken from the individual records of the Public Use Microdata File (PUMF) of the 1991 census. The PUMF is based on a 3 percent sample of the approximately 20 percent of Canadian citizens and permanent residents who filled out the long form census questionnaire. The PUMF contains information on 809,654 individuals, 637,950 of whom were ages 15 or older.

As in the 1986 census PUST, aboriginal people living on- and off-reserve cannot be directly identified from the 1991 census PUMF. Although the procedure to separate the two groups is relatively straightforward in the 1986 census, it is slightly more complex in the 1991 census, in which a special shelter category, "band housing," was created in the housing tenure variable. This category is synonymous with "Indian reserves and settlements." In the individual file PUMF, band housing was merged with rented dwellings for confidentiality reasons. Nevertheless, it is possible to identify with a relatively high degree of accuracy the on-reserve aboriginal population. Subtracting from the total sample all individuals living in owner-occupied and tenant-occupied dwellings leaves us with all individuals living in farm dwellings and band housing, the latter being synonymous with individuals living on Indian reserves and settlements. Further subtracting all individuals who own the farm dwelling in which they live and who live in collective households

and in households outside Canada yields all aboriginal people who live on a reserve or rent a farm dwelling or a room in a farm dwelling. The number of aboriginal people renting accommodation in farms, if significant, would lead to misspecification. Checks of the potential size of this latter group, however, led to a percentage figure that was so small as to render a misspecification problem unlikely.[11] We therefore treated the group in total as the on-reserve population.

The 1991 census asked for the first time if the respondent was a registered Indian as defined by the *Indian Act*. That census thus supplemented the ancestry dimension in the ethnic-origin question by including individuals in the aboriginal population if they reported registered Indian status. To compare this information with 1986 census data, we restricted the aboriginal population to those individuals who reported themselves as having aboriginal origins. Altogether, 19,522 observations formed the basis of the 1991 income distribution analysis. The sample included 2,419 individuals (12 percent) living on-reserve and 17,103 (88 percent) living off-reserve.

Comparisons of the 1986 and 1991 nonaboriginal populations are affected by a change in the 1991 census population. Individuals living in Canada on student authorizations, employment authorizations, minister's permits, and as refugee claimants were enumerated in the 1991 census but not in previous ones. According to the 1991 census, these individuals, referred to as "non-permanent residents," numbered 223,410, or less than 1 percent of the total population. Since the population of such individuals is unequally distributed across the provinces — more than half are in Ontario — we excluded them from the nonaboriginal population. This left us with a sample of 618,428 observations for the distribution analysis in 1991.

1996 Census Data

Unlike the 1986 PUST and the 1991 PUMF, the 1996 Master File contains the total aboriginal and nonaboriginal population. The aboriginal ethnic population totalled 1,101,960 in 1996 of whom 723,230 (66 percent) were of working age. The on-reserve working age population was 143,520 (20 percent) and the off-reserve population was 579,680 (80 percent).

As with the 1986 census, the 1991 and 1996 censuses pose the problem of incomplete on-reserve enumeration. In 1991, 78 reserves and Indian settlements, representing approximately 38,000 individuals, were incompletely enumerated. In 1996, an estimated 44,000 people were missed. Since the nonparticipating reserves are not the same at each census, the composition of the on-reserve sample may have changed between census years in unknown ways.

The Off-Reserve Aboriginal Population

Caution is also required in interpreting possible changes for the off-reserve population. For example, in the 1991 census PUMF, there were 17,103 individuals ages 15 and older living off-reserve and reporting aboriginal origins. The

11 The calculation of the estimated size of the potential misspecification is available from the authors on request.

corresponding number in the 1986 census PUST was 6,987. Given the different sampling rates in the two censuses (3 percent versus 2 percent), this would indicate an increase in the off-reserve population of 64 percent (= [((2%/3%) x (17,103/6,987)) – 1]. An increase of this size over a five-year period is too large to be explained by demographic factors, such as changes in fertility and mortality or migration. The fact that many more individuals decided in the 1991 census than in previous censuses to report aboriginal ancestry shows the volatile nature of ethnic self-reporting. Several factors may account for the recent surge in the number of individuals reporting aboriginal origin, including heightened public awareness of aboriginal issues and changes in the legal criteria that determine native status.[12]

12 For example, Bill C-31, in changing the legal definition of who is a North American Indian, most likely also affected the self-perception of people with aboriginal origins to the extent that many of them reported to be of North American Indian origin in the 1986 and 1991 censuses.

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